UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 July 2007</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-24, 29- 63</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-24, 29- 63</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>22 December 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date __.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

Preliminary Amendment

1.   Preliminary amendment filed on 7/23/07 has been entered.

Information Disclosure Statement

2.   The information disclosure statement (IDS) submitted on 5/7/08; 1/25/08;

1/18/08; 7/23/07; 11/21/05; 12/22/04, the information disclosure statement is being

considered by the examiner.

Drawings

3.   The Examiner has approved drawings filed on 12/22/04.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in
>
> public use or on sale in this country, more than one year prior to the date of application for patent in
>
> the United States.

Claims 1, 4-8, 9-15, 17, 18, 21-24, 29-39, 41-51, 53-58, and 62-63, are rejected

under 35 U.S.C. 102(b) as being anticipated by Kacyra et al., (US patent 5,988,862).

As to claim 1, Kacyra teaches an image generation system for developing three-

dimensional electronic models of objects, the image generation system comprising:

a scanner operable to scan an object and provide geographic position, slope,

and orientation of the scanner and image data representative of the object for each of a

plurality of different geographic locations of the scanner in the vicinity of the object;

(column 3, lines 25-36; column 4, lines 26-41, 42-55; the FDV module 10; column 17,

lines 26-37; column 27, line 60 to column 28, line 8; column 35, lines 12-21; column 5,

lines 23-34; The origin point is the scanner geographic position. The tilt and rotation of

the scanner are the slope and orientation, respectively. The horizontal and vertical

angles for steering the lidar are determined from the tilt and rotation of the scanner. The

absolute coordinate of each point associated with an object is thus determined from the

location of origin point and the tilt and rotation. In column 35, lines 12-21, Kacyra

teaches merge two set data worm together with transformation. The two sets data of the

data world include images taken at each scanner location. The color and texture of a

point on an object are the image data. When two data worlds are combined, absolute

positions of object points needed to be known. To get the absolute positions, the

position, tilt, and rotation of the scanner for obtaining each data world shall be

provided).

a computing system in communication with the scanner, where the computing

system is operable to generate a three- dimensional electronic model of the object by

fitting together the image data provides from each of the geographic locations based on

the scanner position data; (column 4, lines 11-41, column 21, lines 10-62; column 27,

line 60 to column 28, line 8; column 35, lines 12-21; In column 35, lines 12-21, Kacyra

teaches merge two set data worm together with transformation that is a fitting process.

The two sets data of the data world include images taken at each scanner location.

When two data worlds are combined, absolute positions of object points needed to be

known. The absolute positions of the objects are determined based on the position, tilt, and rotation of the scanner. Therefore, the fitting is also based on the position, tilt, and rotation of the scanner).

As to claim 4, where the scanner includes a laser scanner operable to provide geometric point data representative of a geometric shape of the object; (column 3, line 53 to column 4, line 10).

As to claim 5, where the scanner includes a point scanner and a color scanner, the point scanner and the color scanner operable to synchronously provide image data representative of a geometric shape and a color of the object; (column 3, line 53 to column 4, line 10; The laser is the point scanner. The camera is the color scanner).

As to claim 6, where the scanner includes a point scanner operable to collect geometric point data representative of the geometric shape of the object, a color scanner operable to collect color point data representative of the color of the object and a positioning system operable to collect the scanner position data; (column 3, line 53 to column 4, line 10; The laser is the point scanner. The camera is the color scanner).

As to claim 7, where the computing system is operable to associate the color point data, the geometric point data, and the scanner position data to form a three-dimensional electronic image representative of only one scan of the object; (column 4, lines 11-41).

As to claim 8, where the computing system is operable to selectively combine a plurality of three-dimensional electronic images as a function of the scanner position

data to generate a three-dimensional electronic model; (column 20, lines 8-14; column 35, lines 11- 21).

As to claim 18, means for scanning an object, where the means for scanning is operable to determine position data that includes geographic position, slope, and orientation of the means for scanning an object and image data representative of the object for each of a plurality of different geographic locations of the means of scanning in the vicinity of the object; (column 3, lines 25-36; column 4, lines 26-41; the FDV module 10; column 17, lines 26-37; column 27, line 60 to column 28, line 8; column 35, lines 12-21; Also see explanation above).

- a computing system in communication with the means for scanning, where the computing system is operable to associate the position data with corresponding image data and dynamically fit together the image data provides from each of the geographic locations based on the scanner position data to generate a three-dimensional electronic model of the object as a function of the image data and the position information; (column 4, lines 11-41; Also see explanation above).

As to claim 21, where the computing system includes means for joining a plurality of geometric points included in the image data, to form three – dimensional electronic images; (column 4, lines 11-41; column 20, lines 8-14; column 35, lines 11-21).

As to claim 22, where the computing system includes means for manipulating the three-dimensional electronic images; (column 27, line 47 to column 35, line 21; various image processing means are provided).

As to claim 23, where the computing system includes means for combining the three-dimensional electronic images to form the three- dimensional electronic model; (column 20, lines 8-14; column 35, lines 11-21).

As to claim 24, where the computing system includes means for texturizing surfaces of the three dimensional electronic model (column 4, lines 44-55; column 21, lines 10-22).

As to claims 9-15 and 17, the above passages also teach the system and it is interpreted and thus rejected for the same reason as taught by Kacyra).

As to claim 13, Kacyra further teaches the computing system includes a site computing system and a lab computing system, the site computing system is operable to perform a preliminary registration to form a preliminary three-dimensions electronic model, and the lab computing system is operable to perform precise registration of the preliminary three-dimensional electronic model to form a final three-dimensional electronic model. (Fig. 39; column 24, line 32 to column 25, line 58; the left hand side of Fig. 39 provides preliminary registration. The right hand side of Fig. 39 provides the final model).

As to claim 17, Kacyra further teaches the three-dimensional electronic model includes a simple layer, a construction layer, a position layer and a library layer (column 27, line 47 to column 36, line 68; Fig. IA; Each layer is a set of stored database or software).

As to claims 29-35, Kacyra also teaches:

- a memory; (column 4, lines 12-18; column 37, lines 13-19)

- instructions in the memory to perform the functions recited in the claims as

discussed above; (column 16, line 54 to column 17, line 8).

As to claims 32-34 Kacyra also teaches :

As to claim 32 where the instructions in the memory device to join the geometric

points comprise instructions in the memory device to partition each of the three-

dimensional electronic images into sub-images; (column 18, line 5 to column 19,

line 35).

As to claim 33 where the instructions in the memory device to join the geometric

points comprise instructions in the memory device to develop a plurality of lines,

where each of the lines is representative of one of the sub-images; (column 18,

line 5 to column 19, line 35).

As to claim 34 where the instructions in the memory device to combine the three-

dimensional electronic images comprise instructions in the memory device to

position the lines with respect to each other; (column 18, line 5 to column 19, line

35).

As to claim 35 where the image data also includes color points and instructions in

memory to develop a plurality of lines comprise instructions in the memory device

to convert the geometric points and the color points to a line that replaces the

geometric points and the color points. (column 18, line 5 to column 19, line 35;

column 19, lines 10-37; column 21, lines 12-61; column 22, lines 16-26; In the

modeling, some points are connected to form lines).

As discussed in the above passages, Kacyra also teaches the corresponding

methods of Claims 36-39, 41-51, 53-58, and 62- 63. Kacyra teaches that the

recited color points (column 3, lines 25-64; column 4, lines 20-55; The lidar

generates range and intensity data. The video system also provides the color

points). Kacyra teaches that the source texture is an image file (column 3, lines

25- 36; column 27, line 47 to column 36, line 68; Fig. IA; Each layer having

texture information is a set of stored database and thus is associated with an

identifier).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of

the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior

art under 35 U.S.C. 103(a).

Claims 2-3, 19-20, 40, and 59-61 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Kacyra et al. (US patent 5,988,862) as applied to claims above(

1, 4- 15, 17-18, 21-24, 29- 39, 41-51, 53- 58, 62-63) and further in view of Margolin

(US patent 5,566,073).

Kacyra teaches, as discussed above, image generation systems of Claims 1, 9,

18, 25, 29 and methods of Claims 36, 45, and 53. Kaeyra teaches also the facing

direction of the scanner. (The horizontal and vertical angles for steering the lidar

is the facing ~rection of the scanner).

Kacyra , does not teach the features related to satellite positioning system and

slope orientation sensor.

Margolin teaches synthesizing a view of world with providing navigational

coordinates to be used as an electronic map comprising:

- a satellite positioning system to provide position information that is also navigational

coordinates including an elevation; (abstract, column 6, lines 7-65; column 7, line 40 to

column 8, line 3; Figs. I and 3).

- an altitude sensor for providing also elevation data; (column 6, lines 7-32) - slope

orientation sensor; (abstract,; column 6, lines 7-65; column 7, line 40 to column 8, line 3;

Figs. I and 3).

It is desirable to provide an electronic map with a 3D model drawing to facilitate

understanding of objects and structures shown on the map. It would have been obvious

to one of ordinary skill in the art, at the time of the invention, to use Kacyra's CAD in

Margolin's system to develop an electronic map representing a synthetic environment

for pilot aid because the combination generates an electronic map with a 3D model

drawing to facilitate understanding of the map.

The combination thus provides navigation coordinates, an elevation, a facing direction

of the scanner and a pitch and a roll of the scanner.

As to claim 3, where the slope orientation sensor is operable to provide a pitch,

a roll and an orientation of the scanner. (abstract, column 6, lines 7-65; column 7, line

40 to column 8, line 3; Figs. I and 3).

6.   Claims 16 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Kacyra et al. (US patent 5,988,862)) as applied to claims above 1, 4-15, 17-18,

21-24, 29- 39, 41-51, 53- 63 and further in view of in view of Pctrov et al. (US patent

Application Publication 2001/0056308).

Kacyra teaches, as discussed above, image generation system of Claim 15 and

methods of Claim 45. Kacyra, does not teach the triangle and color blending recited in

the claims.

Petrov et al. teaches generating 3D model comprising:

- filling in color in a surface of each of the three-dimensional electronic images by

division of the surface into triangles and color blending between color point data within

each of the triangles. (Figs. 8(a)-(d); sections 0005, 0025, 0041, and 0047)

It is desirable to improve the appearance of a 3D model by smoothly blending an area

with its neighbors. It would have been obvious to one of ordinary skill in the art, at the

time of the invention, to apply Petrov's teaching to represent the surface of Kacyra's

objects with triangular patches and blend the color of a patch with its neighbors because

the combination improves the appearance of the 3D model.

Contact Information

7.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Sheela C Chawan whose telephone number is. 571-

272-7446. The examiner can normally be reached on Monday - Thursday 7.30 - 6.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

/Sheela C Chawan/

9/13/09

Primary Examiner, Art Unit 2624